

AMENDMENTS TO THE CLAIMS

1. (Currently amended) ~~Method of hot-shaping a steel part, wherein:~~

~~— a billet of steel is obtained with the following composition;~~

~~— $0.35\% \leq C \leq 2.5\%$~~

~~— $0.10\% \leq Mn \leq 2.5\%$~~

~~— $0.60\% \leq Si \leq 3.0\%$, with preferably $Mn\%/Si\% \geq 0.4$~~

~~— $traces \leq Cr \leq 4.5\%$~~

~~— $traces \leq Mo \leq 2.0\%$~~

~~— $traces \leq Ni \leq 4.5\%$~~

~~— $traces \leq V \leq 0.5\%$~~

~~— $traces \leq Cu \leq 4\%$ with $Cu \leq Ni\% + 0.6 Si\%$ if $Cu \geq 0.5\%$~~

~~— $traces \leq Al \leq 0.060\%$~~

~~— $traces \leq Ca \leq 0.050\%$~~

~~— $traces \leq B \leq 0.01\%$~~

~~— $traces \leq S \leq 0.200\%$~~

~~— $traces \leq Te \leq 0.020\%$~~

~~— $traces \leq Se \leq 0.040\%$~~

~~— $traces \leq Pb \leq 0.070\%$~~

~~— $traces \leq Nb \leq 0.050\%$~~

~~— $traces \leq Ti \leq 0.050\%$~~

~~— optionally: $traces \leq P\% \leq 0.200\%$, $traces \leq Bi \leq 0.200\%$, $traces \leq Sn \leq 0.200\%$, $traces \leq As \leq 0.200\%$, $traces \leq Sb \leq 0.200\%$, with $P\% + Bi\% + Sn\% + As\% + Sb\% \leq 0.200\%$, the remainder being iron and impurities resulting from the manufacture.~~

~~— a heat treatment is if need be applied to it, which gives it a globular primary structure;~~

~~— it is heated to an intermediate temperature between its solidus temperature and its liquidus temperature under conditions such that the solid fraction has a globular structure;~~

~~— thixoforming of the said billet is carried out so as to obtain the said part;~~

~~— and cooling of the said part is carried out~~

A method of hot-shaping a steel part, which comprises obtaining a billet of steel with the following composition:

$0.35\% \leq C \leq 2.5\%$

$0.10\% \leq Mn \leq 2.5\%$

$0.60\% \leq \text{Si} \leq 3.0\%$

$\text{traces} \leq \text{Cr} \leq 4.5\%$

$\text{traces} \leq \text{Mo} \leq 2.0\%$

$\text{traces} \leq \text{Ni} \leq 4.5\%$

$\text{traces} \leq \text{V} \leq 0.5\%$

$\text{traces} \leq \text{Cu} \leq 4\%$ with $\text{Cu} \leq \text{Ni}\% + 0.6 \text{ Si}\%$ if $\text{Cu} \geq 0.5\%$

$\text{traces} \leq \text{Al} \leq 0.060\%$

$\text{traces} \leq \text{Ca} \leq 0.050\%$

$\text{traces} \leq \text{B} \leq 0.01\%$

$\text{traces} \leq \text{S} \leq 0.200\%$

$\text{traces} \leq \text{Te} \leq 0.020\%$

$\text{traces} \leq \text{Se} \leq 0.040\%$

$\text{traces} \leq \text{Pb} \leq 0.070\%$

$\text{traces} \leq \text{Nb} \leq 0.050\%$

$\text{traces} \leq \text{Ti} \leq 0.050\%$

optionally: $\text{traces} \leq \text{P}\% \leq 0.200\%$, $\text{traces} \leq \text{Bi} \leq 0.200\%$, $\text{traces} \leq \text{Sn} \leq 0.200\%$, $\text{traces} \leq \text{As} \leq 0.200\%$, $\text{traces} \leq \text{Sb} \leq 0.200\%$, with $\text{P}\% + \text{Bi}\% + \text{Sn}\% + \text{As}\% + \text{Sb}\% \leq 0.200\%$, the remainder being iron and impurities resulting from the manufacture;

heating the billet to an intermediate temperature between its solidus temperature and its liquidus temperature under conditions such that the solid fraction of the billet has a globular structure;

thixoforging the billet so as to obtain the said part;

and cooling the said part.

2. (Currently amended) The method according to ~~Method as claimed in~~ Claim 1, wherein the said thixoforging takes place in a zone of temperatures where the liquid material fraction present in the billet is between 10 and 40%.

3. (Currently amended) The method according to ~~Method as claimed in~~ Claim 1, wherein the said cooling is effected in still air.

4. (Currently amended) The method according to ~~Method as claimed in~~ Claim 2, wherein the said cooling is effected in still air.
5. (Currently amended) The method according to ~~Method as claimed in~~ Claim 3, wherein the said cooling is carried out at a speed lower than that which would obtain natural cooling in air.
6. (Currently amended) The method according to ~~Method as claimed in~~ Claim 4, wherein the said cooling is carried out at a speed lower than that which would obtain natural cooling in air.
7. (Currently amended) A steel part ~~Steel part wherein it is obtained~~ by a hot-shaping method as claimed in Claim 1.
8. (New) The method according to Claim 1, wherein the Mn and Si contents of the billet satisfy the relationship $\text{Mn\%/Si\%} \geq 0.4$.
9. (New) The method according to Claim 1, which further comprises heat treating the billet to give the billet a globular primary structure, before heating the billet to the intermediate temperature.